

Mystery Revealed: Researchers Create a Cure for Superior Canal Dehiscence Syndrome

Cases of people who grow dizzy or lose their balance because of excess noise or changes in pressure—even by merely coughing or laughing—had stumped clinicians for decades. But research conducted at Johns Hopkins has led to advances in defining and treating this rare and little-known medical phenomenon, called superior canal dehiscence (SCD) syndrome.

Fascinated by the relationship between balance problems and eye movements, Lloyd Minor and colleagues tracked the eye movements in his patients with dizziness problems and found a number of patients had tiny holes in the upper arch of the inner ear cavities directly above the superior semicircular canal. Changes in intracranial pressure carry through the minute openings to cause the balance-sensitive canal to bulge; this sometimes leads to a chronic state of imbalance and causes the ear to be hypersensitive to sound and motion.

Minor and his team discovered that surgically closing the dehiscence, or the area in the superior canal where the bone casing has the cracks, with a plug of fascia and bone puts an end to the symptoms.

The surgery, which takes from four to six hours, is extremely delicate. Surgeons first cut a hole above the ear and open the skull, then move aside a part of the brain to reach the superior canal of the inner ear. The canal is plugged with fibrous tissue and small chips of the patient's bone taken from the area of incision and skull opening. Once the plug is positioned within the lumen of the canal, the surgeon tamps it into the canal's opening and allows the brain's dura to return to its position over the spot.

Since the team saw its first patient with the condition in 1995, it has successfully operated on 50 people. The surgeons are learning more about SCD all the time; further knowledge could lead to earlier diagnosis with simpler tools that physicians across the country could use.

“The results of our work should allow surgeons to better counsel their patients with SCD on what is the likely improvement in symptoms after the procedure,” says surgeon John Carey, one of the lead authors of the studies.

FULL ARTICLES

Carey J, Migliaccio A, Minor L. Semicircular canal function before and after surgery for superior canal dehiscence. *Otology & Neurotology* 2007; 28:356–364.

Limb C, Carey J, Srereddy S, Minor L. Auditory function in patients with surgically treated superior semicircular canal dehiscence. *Otology & Neurotology*. 2006;27:969–980.

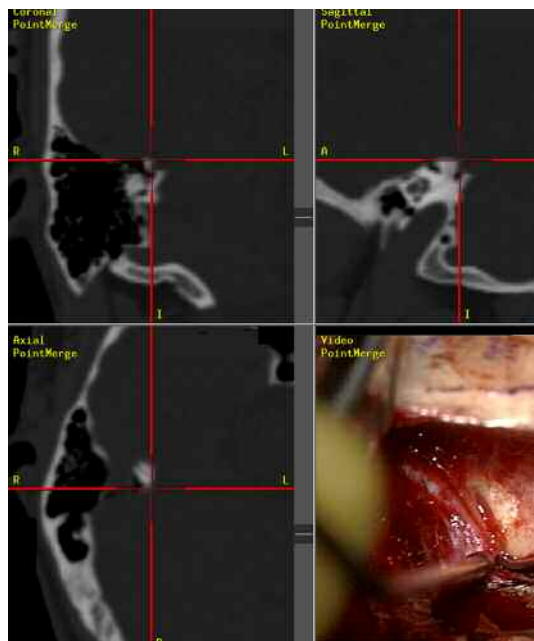


Image navigation is used during the surgery to repair superior canal dehiscence. The patient's CT scan, obtained preoperatively to confirm the diagnosis and show the location of the dehiscence, is displayed in three planes of view referenced to an instrument used in the surgery. The lower right panel shows the image through the operating microscope.